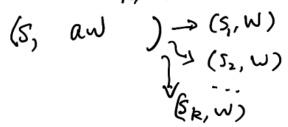
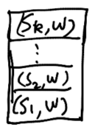
Algorithm ideas for NFA

Assume we are at state S and string so far is $\underline{aw}$. Let the set of states from S and symbol a be $\{s_1, \cdots, s_k\}$ by the transition relation Δ, i.e., $\Delta(s,a) = \{s_1, \cdots, s_k\}$. The current configuration is (s, aw), and we have k next configurations: $(s_1, w), \cdots, (s_k, w)$.



We can push them into a stack for future processing



Then we pop the stack to get the configuration (s_k, w) and repeat the process above

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pseudo code sketch

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execute:

input: w: a string

output: result: true if accepted by NFA

false otherwise

result := false, push((1, w)) ← initial state

while stack ≠ empty

pop() → conf

let conf be (s, w_1).

if $w_1 = \varepsilon$ & s is final

result := true

break

else if $w_1 = \varepsilon$

then continue

else if $w_1 = \varepsilon$

then continue

else let $w_1 = b w_2$

let $\Delta(s, b) = \{s_1, \cdots s_n\}$

push(s_1, w_2)

push ...

push(s_n, w_2)